

Further Studies on the Internal Anatomy of the Meloidae. III. The Digestive and Reproductive Systems as Bases for Tribal Designation of *Pseudomeloe miniaceomaculata* (Blanchard)* (Coleoptera: Meloidae)

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Abstract: The digestive and reproductive systems of *Pseudomeloe miniaceomaculata* (Blanchard) has been described. On the basis of such internal anatomical features as V-shaped folds in the stomodaeal intima, absence of a basal spermathecal diverticulum, a tubular female accessory gland, an irregularly convoluted first pair and a recurved or bent second pair of male accessory glands, this genus is placed in the tribe Eupomphini of the subfamily Meloinae. The inclusion of *Pseudomeloe* in Eupomphini now extends the distribution of this tribe to South America as well.

In 1928, Van Dyke defined the tribe Calospastini (= Eupomphini) and stated that "the tribe is restricted to North America." Gupta (1965) showed that all the members of this tribe shared several internal anatomical features. On examination, the South American blister beetle, *P. miniaceomaculata* was found to possess all the characteristic tribal features of Eupomphini, as defined by the present writer (1965). The purpose of the present paper is to describe the internal anatomy of this beetle, and to establish its inclusion in the tribe Eupomphini. The beetles were collected and identified by Dr. Antonio Martinez, Buenos Aires, Argentina, and were kindly made available to the author by him.

MATERIALS AND METHODS

For technical details, the reader is referred to the earlier work (Gupta, 1965). In the present paper, descriptions have been kept to the minimum, and are meant to supplement the diagrams, and point out important features. In the drawings of the reproductive systems, only the organs of one side have been shown. In the drawing of the male reproductive system, the second pair of accessory glands has been stippled to distinguish it from others. Phase contrast photomicrographs of the stomodaeal intima are included for the first time in this series of papers. All photomicrographs were taken by Leitz dark phase microscope at magnifications of 250× and 400×. For this purpose, the intima was lightly stained in azocarmine.

DESCRIPTIONS

DIGESTIVE SYSTEM: EXTERNAL (Fig. 1):

Esophagus much broadened posteriorly; ventriculus with few remnants of transverse wrinkles; lobes of pyloric valve barely visible externally; six malpighian tubules arising

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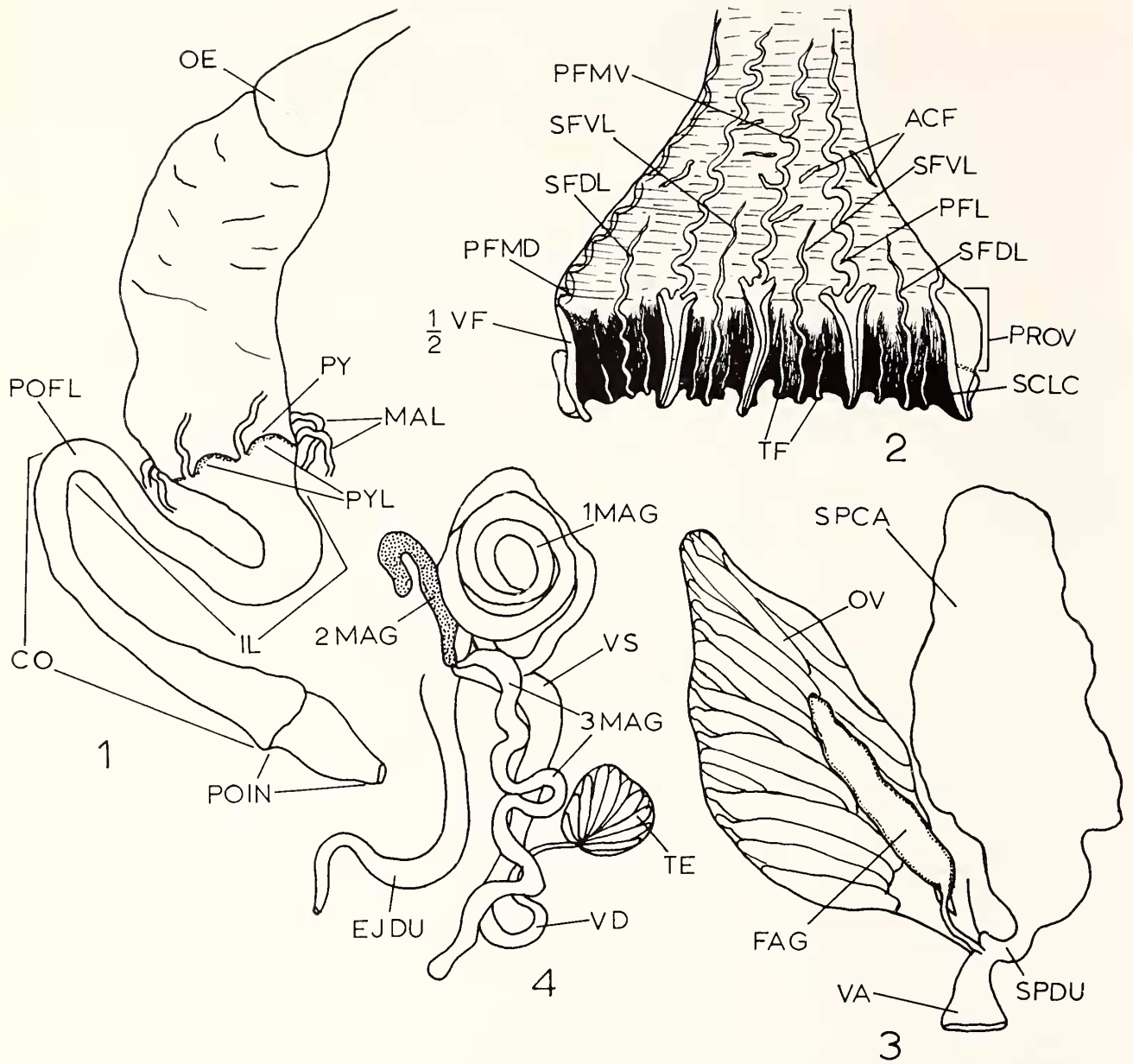


FIG. 1. Lateral view of alimentary canal. FIG. 3. Female reproductive system, dorsal view.
 FIG. 2. Internal view of stomodaeum. FIG. 4. Male reproductive system, ventral view.

ABBREVIATIONS USED IN FIGURES

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|----------------|-------------------------------------|----------------|-------------------------------|
| ACF | accessory folds | POIN | posterior intestine or rectum |
| CO | colon | PROV | proventriculus |
| EJDU | ejaculatory duct | PY | pylorus |
| FAG | female accessory gland | PYL | lobes of pyloric valve |
| IL | ileum | SCLC | sclerotized channel |
| 1MAG | first pair of male accessory gland | SFDL | dorsolateral secondary fold |
| 2MAG | second pair of male accessory gland | SFVL | ventrolateral secondary fold |
| 3MAG | third pair of male accessory gland | SPCA | spermathecal capsule |
| MAL | malpighian tubules | SPDU | spermathecal duct |
| OE | esophagus | TE | testis |
| OV | ovary | TF | tertiary fold |
| PFL | lateral primary fold | VA | vagina |
| PFMD | median dorsal primary fold | VD | vas deferens |
| PFMV | median ventral primary fold | VF | V-shaped fold |
| POFL | posterior flexure | VS | vesicula seminalis |

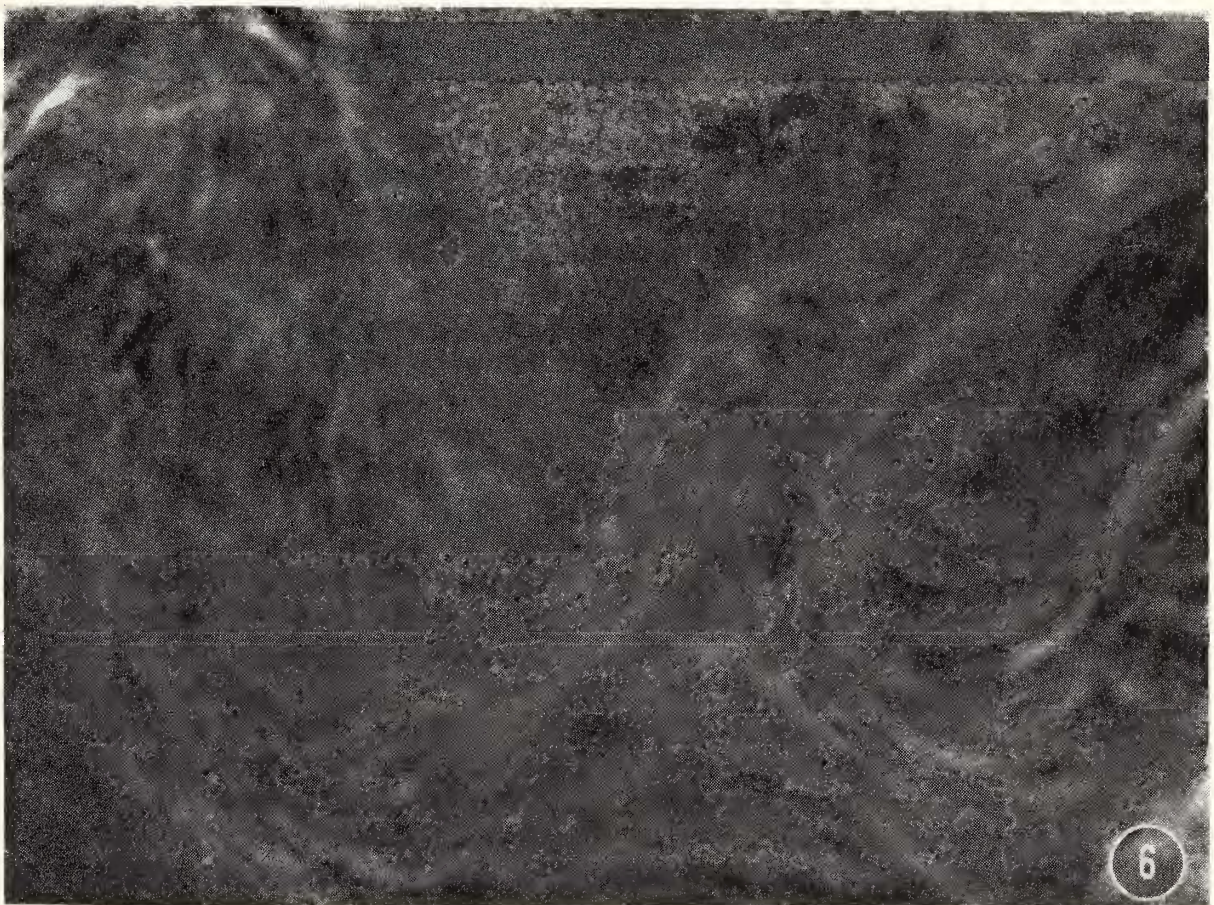
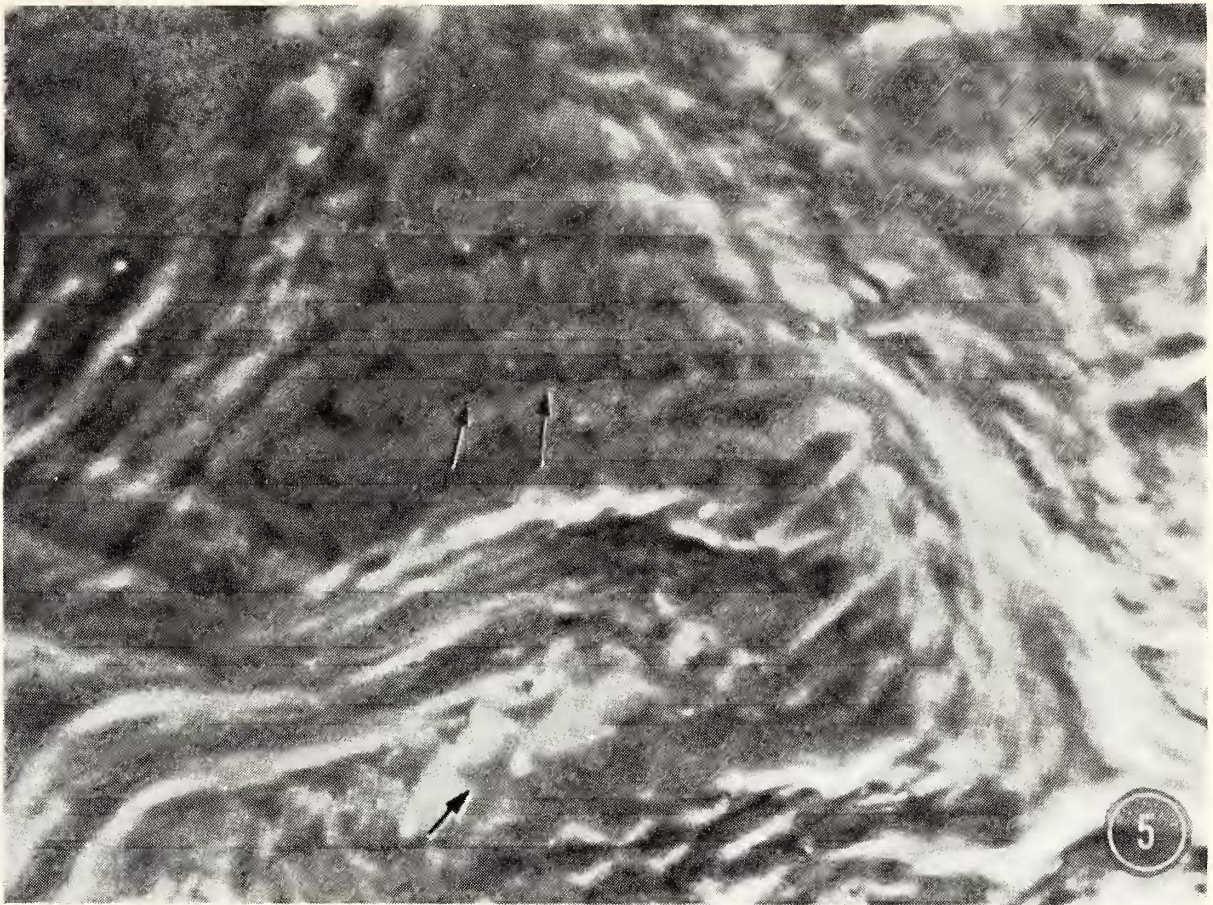


FIG. 5. Magnified view of stomodaeal intima showing emarginate thickenings provided with microscopic spines (arrows).

FIG. 6. Magnified view of portion of median ventral primary fold showing stout spines.

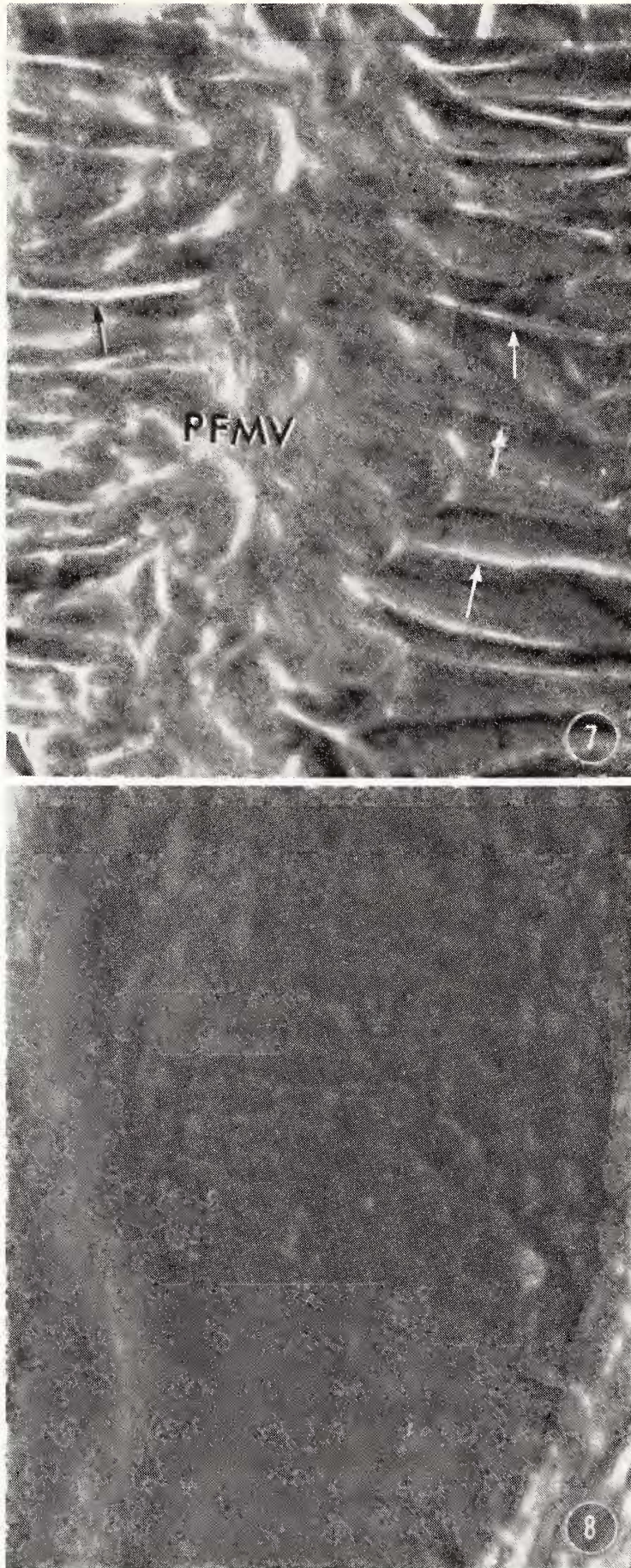


FIG. 7. Magnified view of portion of median primary fold and transverse corrugations (arrows).

FIG. 8. Magnified view of portion of sclerotized channel showing irregular rectangular and polygonal patterns.

separately, their posterior attachment at inner bend of posterior flexure, basal swelling absent. INTERNAL (Figs. 2, 5-10): Stomodaeal intima with 4 primary, 4 V-shaped, 4 secondary and 8 tertiary folds, several irregularly arranged accessory folds present in regions of esophagus and proventriculus; transverse corrugations discontinuous; V-shaped folds continued posteriorly into primary stomodaeal lobes and flanking sclerotized channels, latter more sclerotized than those flanked by secondary and tertiary folds, latter flanking sclerotized channels between secondary and V-shaped folds in proventricular region, surface of stomodaeal intima with emarginate thickenings provided with microscopic spines, spines on primary, V-shaped and secondary folds stout, spines also present on apices of stomodaeal lobes, surface of sclerotized channels with irregular rectangular and polygonal pattern without spines. Stomodaeal valve with 4 primary lobes, secondary and tertiary lobes poorly developed.

REPRODUCTIVE SYSTEM: FEMALE (Fig. 3):

Spermathecal capsule robust, constricted near base, portion beyond constriction broadened, rather wrinkled, tapering distally, portion below constriction rounded and smooth, spermathecal duct short and curved; accessory gland tubular, elongate, tapering distally, and with a short duct; vagina very short. MALE (Fig. 4): Testes rather large, spherical, vas deferens narrow near testis, vesicula seminalis rather narrow; first pair of accessory gland ovally or spherically coiled, second pair smallest and recurved distally, recurved portion shorter than basal portion, third pair larger than second and convoluted; ejaculatory duct slightly broader beyond middle, very strongly bowed and bent distally.

MATERIAL EXAMINED: 7 specimens (in 8% formaldehyde), Pcia. de Buenos Aires, Partido de Puan, Estacion Felipe Sola, I-31-1966 (A. Martinez).

TRIBAL DESIGNATION: Fairmaire and Germain first established the genus *Pseudomeloe* in 1863 (Borchmann, 1917). Beauregard (1890) grouped this genus, among others, with *Meloe*, *Megetra* and *Cysteodemus* in the category of "Meloites." Later, Borchmann (1917) and Blackwelder (1945) also grouped *Pseudomeloe* with several presently recognized eupomphine genera in the tribe Meloini. Denier's (1935) tribe Lyttini also consisted of *Pseudomeloe* and such genera as *Tetraonyx*, *Pyrota*, *Lytta*, *Meloe* and several of the current eupomphine genera. As far as is known, there is no mention of the inclusion of *Pseudomeloe* in the tribe Calospastini (= Eupomphini), after this tribe was first established by Van Dyke in 1928. He included *Calospasta* (= *Eupompha*), *Tegrodera*, *Gynaecomeloe*, *Cysteodemus*, *Megetra*, *Pleurospasta*, *Phodaga*, *Negalius*, *Cordylospasta* and *Brachyspasta* in this tribe. Gupta (1965) demonstrated that members of this tribe, as constituted by Van Dyke, show such common features as V-shaped folds in the stomodaeal intima, a spermathecal capsule without a basal diverticulum, a tubular female accessory gland, an irregularly convoluted first pair of male accessory glands, and a recurved or bent second pair. He further stated that on the basis of the number of V-shaped folds, and tertiary intimal folds, the tribe can be divided into 2 groups: one group with 3 V-shaped folds and 6 tertiary folds (*Phodaga* and *Negalius*), and the other with 4 V-shaped folds and 8 tertiary folds (*Eupompha*, *Tegrodera*, *Gynaecomeloe*, *Cysteodemus*, *Megetra* and *Pleurospasta*). He did not study *Cordylospasta* and *Brachyspasta*.

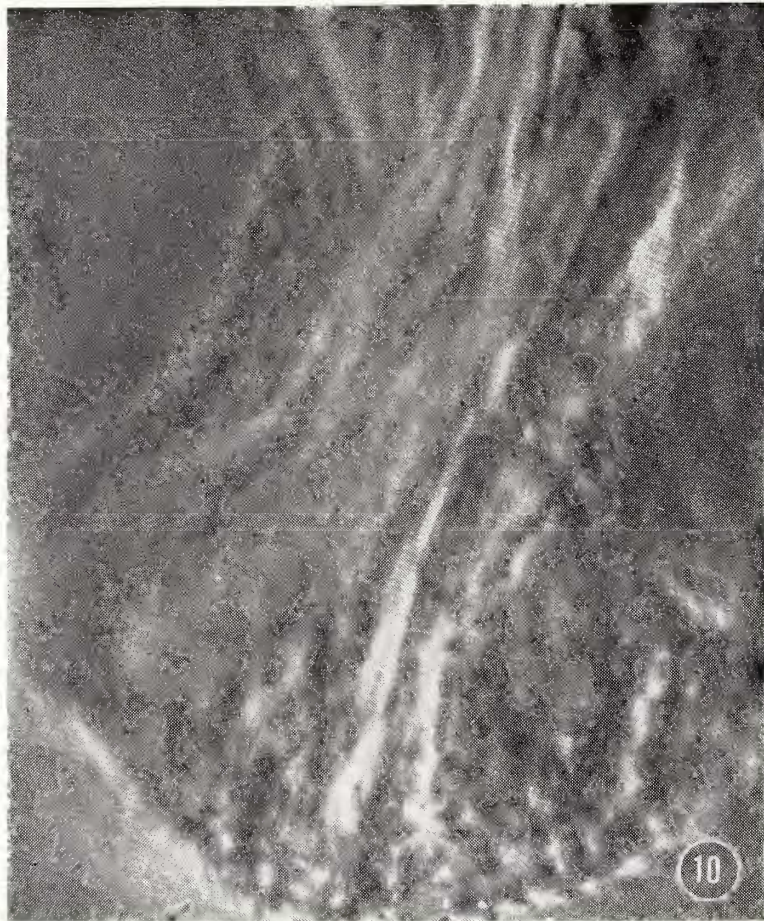


FIG. 9. Magnified view of portion of V-shaped fold showing spines.

FIG. 10. Magnified view of tip of one of the primary stomodaeal lobes showing spines.

Examination of the internal anatomy of *Pseudomeloe* revealed that it possesses all the characteristic features of Eupoinphini, as defined by Gupta, and belongs to the group with 4 V-shaped and 8 tertiary folds. Its inclusion in the tribe Meloini cannot be justified since it does not possess a well-developed vesicular spermathecal diverticulum, and a reduced 1st pair of male accessory glands, features which are characteristic of the tribe Meloini. Similarly, the presence of V-shaped folds and the absence of a well-developed spermathecal diverticulum precludes its inclusion in Lyttini. The placement of *Pseudomeloe* in Epicautini, Tetraonycini, and Pyrotini on the basis of V-shaped folds alone cannot be justified inasmuch as it does not possess several of the important features of these three tribes. That *Pseudomeloe* appropriately belongs to the Eupomphini seems certain, and its inclusion in this tribe thus extends the latter's distribution to South America as well.

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